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T H E

# AMERICAN NATURALIST.

Vol. IX. — JANUARY, 1875. — No. 1.



## THE PINE SNAKE OF NEW JERSEY.

BY REV. SAMUEL LOCKWOOD, PH.D.



IN the “pines” of southern New Jersey, which probably is the northern limit of the species, is a notable serpent, reputed to attain the great length of nearly twelve feet, and whose body is then, in common parlance, “as thick as your arm,” or in more moderate speech, from three and a half to four inches in diameter. Not that the writer has seen any of such dimensions, but he gives what may be called the mean of popular observations. This reptile has a shiny coat of a soft creamy white, upon which is laid, much in the Dolly Varden mode, showy mottlings or blotches, which, beginning at the neck, are of an intensely dark brown or chocolate color, but which toward the tail lighten up into a pale bright chestnut. Such is the pine snake; and its habitat and traits are well expressed in the beautifully significant name which science has given it — *Pituophis melanoleucus*, which literally means, “the black and white serpent of the pines.” If one consider the formidable size it is said to reach, together with its notably harmless nature, and the splendid adornings of its scaly armature, distinguished mention must be made of this reptile, as the most remarkable serpent of the Eastern States.

The first time I saw the pine snake alive was eighteen years ago. I was on the steamboat going from Keyport to New York. It was the berry season, and persons from the pines were on

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board taking their eggs and "huckleberries" to the city market. The Pines, so called, had not up to that time been visited by me. "Forrard" of the boat, being the place where the hucksters, farmers and fishermen most did congregate, was a sudden and unusual commotion. One solitary woman held her own in this crowd of men. She was from the Pines, and in her way was an intensely thorough-going business body. She had a wagon-load of eggs and berries, which latter she had bought of the pickers, and on them she expected to "realize" handsomely. The assistant captain, an elderly and corpulent man, was collecting the fare. Approaching the female huckster, whom he knew well, he accosted her with "Come, Peggy, your fare." "Yes, Cap'en, but jist hold my comforter till I git my pus out." And in a trice a pair of pine snakes, concealed beneath the woman's shawl, were slung around the captain's neck. The old man's example was electric! Such accelerated evolutions! It seemed neck or nothing with everybody but the huckster woman, who sat shaking with laughter. She had retained hold of the reptiles by the tails, so that they were left in her hands. She was taking them to Barnum, who probably would give her a few shillings, and a few tickets to his show. Prof. Baird had just before requested me to get a pair of these reptiles for the Smithsonian. My mind was made up that these should go to the Professor. At this juncture a fisherman whispered into the woman's ear, "Keep your eyes skinned, Aunt, a science man's around." The woman became at once very exacting. I bought the pair at an unreasonable price; but an accident prevented their ever seeing Washington. They were of both sexes, I think, and were about three and a half feet long. Their harmlessness surprised me. Even my little children played with them. Indeed the late Prof. Torrey, a good many years ago, had a pair that were allowed the freedom of his study floor. The female of my pair laid seven eggs, each about five-eighths of an inch long. From their size they must have been premature.

Three summers ago a friend captured a fine female specimen and sent me. It was in good condition, nearly six feet in length, and as thick as my wrist. To my surprise the beast was incorrigibly irritable, and kept up a vicious blowing, and darting at me, each time hitting her nose against the glass cover of her box, so that, much to my grief, she knocked off the hard scale on the tip of her snout. The cause of this unexpected conduct was not far

to seek. The poor thing had the cares of maternity coming upon her. On the 18th of July she laid twelve white eggs; and a beautiful sight did they present. There were two clusters, the eggs adhering to one another. Two of the eggs were under the average size. These seemed to have been laid first. There was one still smaller which seemed to have been laid the last. In one of these clusters were seven eggs and in the other five. I was astonished at their size. A single egg measured twenty-two lines in length, and sixteen in width. They were in fact as large as the eggs of an ordinary bantam fowl. One of them weighed 543 grs., and the whole weighed about fifteen ounces avoirdupois. They were of nearly the same form and size at each end, except that at the upper end, or the end last evicted, was a little cusp, or teat-like prominence, precisely such as characterizes the fossil coprolites, and due to the same cause, the nipping off, or closing up of the cloaca, as the egg in its soft condition passed out. The eggs at this precise moment must be quite soft, as they were agglutinated together side by side. An attempt to separate a pair succeeded in pulling off a portion of the shell which adhered to the other egg. In this regard the resemblance to insect eggs was striking. The shell had a fine and pretty marking, as of reticulation.

An attempt was made to hatch the eggs, but without success. They were put in a box of sand, which was moistened, and every effort made to preserve the proper temperature by keeping it warm; but the eggs perished. It is curious that in all my inquiry of the old settlers in the Pines, I have learned nothing about the eggs of the pine snake, — no one, so far as I could ascertain, had ever seen them.

It is interesting to observe the pine snake drink. It lays its head usually flat upon the water, letting the lower jaw just sink a little below the surface, when with a very uniform movement, the water is drawn up into the mouth and passed into its throat. It is the same as the drinking of a horse; that is, it is a true drinking. With a snake, lapping is an impossibility; the form and position of the tongue are unsuited for such an act. The tongue of a serpent is like a flattened cord, divided at the forward end into two pointed threads as soft and flexible as silken fibres. This delicate organ is projected from a round orifice in the middle, and somewhat forward of the trough or hollow of the lower jaw. And

a very beautiful functional arrangement all this is; for as might be conjectured, when swallowing its prey entire, the tongue must be put out of the way. In this emergency it actually disappears from the mouth altogether, being withdrawn at the orifice mentioned. Drinking, with the pine snake, is a slow affair. I have several times watched it by the clock. Once it drank exactly five minutes without taking breath. It then paused, looked about for three minutes, and went at drinking again, occupying precisely five minutes as before, thus making ten minutes. The amount of water drank was a little over a gill. Previous to this drinking she had been without water four weeks.

The reptiles have seemed to me specially to be capricious and fastidious about feeding in confinement. The pair of small pine snakes mentioned at the outset ate young chickens just from the nest, but would not touch mice. My large one for a whole month after laying her eggs had not eaten anything. A young chimney swallow was given her, but, though the little thing fluttered and cried, she took no notice of it. A young chick three days old was offered, nor would she notice it. Both birds were removed unhurt, in fact, untouched. A rat with a limb broken by the trap was next put in her box. Her attention was at once aroused. After looking intently at it for a minute, she made a sudden dart, striking the rat on its side with her nose. With a squeak, the poor thing turned its face towards its grim assailant. The latter with head erect, but motionless, and tongue quivering, kept its eyes steadily on its victim. There was a sudden spring, and the rat's nose was in the grip of the monster's mouth. Quickly, but deliberately, the snake held its victim against the side of the box; then setting the sharp edge of each of the long scuta or abdominal scales on the floor, as a fulcrum, brought a part of its body, like the convex side of a strong bow, against its prey, forcing it to the side of the box with a compression that made the bones of the rat give a crackling sound. The suffering of the victim was but for a moment, as I have no doubt that the spine was broken instantly. Although the prey was quite dead, there was still that singular deliberation, and several minutes elapsed before that compression was relaxed. Quietly now the snake began the act of swallowing its prey. It commenced with the head. The action of the creature is very interesting. It is not by a uniform movement of the entire prey that the swallowing is performed. The snake opens

its mouth widely on one side, and then gives a slight hitch with its outer teeth, or the teeth on the opened side of the mouth. This done the mouth is kept closed on that side of its prey, and the other side of the mouth is now opened, and the same hitching gone through; and so the action is alternated, the hitching being about two minutes on each side by turn. It is pretty much as if the finger of a tight thread glove should be drawn on by using the nails of a thumb and finger successively on the sides. This is a beautiful mechanical movement, by which the force applied is admirably economized, a prime consideration when food in a mass much larger than the head and neck of the snake is to be passed entire through the gullet. The swallowing is so extremely slow that the movement is practically imperceptible. With watch in hand I found when the hind legs of the rat disappeared twenty minutes had elapsed since the swallowing began. The tail of the prey is the last to disappear. But in the final movement the mouth of the snake takes no part. The body having passed the gullet there is a vigorous muscular action along the long thorax. To our astonishment we now heard again that singular crepitating sound which resembled the breaking of the bones; could it be the breaking of the ribs? In slowness of eating and drinking our ophidian fulfils strictly the precept of the most exacting hygienist. But what about the 'breathing for those twenty minutes during which the entire throat was closed as tightly as the wadding stops up a gun? Surely for the time being respiration was absolutely checked. As if to make up for this estoppel of its breath, the creature is now gaping so widely that a fine opportunity is afforded to inspect the interior of its mouth.

A fact observed here, as also when I fed the smaller ones with birds, was that the snake did not beslime or lubricate its victim before swallowing. I had expected to see this; for I once caught a large black snake, *Bascanon constrictor*, robbing a nest of young birds. The nest was in a hummock of grass in a swamp. It had two birds on the ground, one of which was literally enveloped in white slime, like a fly in a cobweb, and the other was in process of lubrication. Unfortunately the snake saw me, and the process was stopped, as the animal now tried to escape.

By the old settlers in the Pines, this reptile is often called the bull snake, because of the remarkable sound it makes when blowing. A case was told me of a large pine snake being captured by

a farmer's boy, who tied a string around its tail, and having taken it home, tied the string to a small bush near the kitchen door. Not intending anything, the boy said nothing about it. As the family were at supper, the snake commenced blowing. This was heard by the good mother, who cried out, "There, that bull's got into the corn field again!" The boy broke into laughter, and then told what he had done. And well do I remember my boyish terror at hearing a similar sound. It was the restrained bellowing of a bull, which came upon me suddenly in a field. There is nothing sibilant in this blowing of the pine snake, not the slightest hiss about it. The animal slowly fills its long thorax with air, and then expels it with a bellowing which is really formidable.

Observations made on an animal in confinement should be weighed accordingly. A fact given me by an old resident in the "Pines" would indicate that the pine snake is a great feeder. He said he saw one killed, out of which were taken two young rabbits and twelve quail eggs (the eggs may have been her own). This snake likes to get under barns, without doubt in quest of rats and mice. But for the above statement, I might have inferred from my specimen that the species is a moderate feeder, as it often refused food offered it. About a week after the swallowing of the two rats I put a live one into the snake's box. She was not hungry, and was evidently annoyed by the rat's presence. So she made a dart, striking it on its side. The rat, plucky in its terror, turned upon and bit its assailant. This was a new experience to the reptile, and momentarily dazed with incomprehension of the situation, it recoiled upon itself. It was, however, beside itself but for a moment, for it instantly became alive with subtle action. The tongue quivered with excitement, and that living cable, which made up those fearful coils, began a rapid thickening. The creature seemed to be inhaling air down its whole length. Now began that fearful blowing. It was truly a bellowing of snakish rage, and was followed up by a savage dart at the innocent intruder, which gallantly returned the compliment with another nip of its sharp teeth, sending the snake back in haste to the farther corner of the box. I noticed that the rat was in nowise stupefied, or affected in any way corresponding to the so-called fascination of serpents. Keeping its head raised, eyes fixed and tongue quivering, the snake filled with air again; then again

came that appalling sound, and another dart, with the same response from the rat. I cannot depict the seeming tussle of each round. It was not so much on either part an effort to close in, as it was to deliver its own shot, and then get out of the way, so that on the part of the snake each charge received caused a squirming that looked like a wild beating of the air. She went at the poor rodent again and again. Matters were waxing desperate. The rounds were quicker and more severe. There was less blowing and harder fighting. I was now desirous to separate them, but knew not how to bring it about. The truth told, I was getting to be somewhat nervous about the personal appearance of my beautiful serpent, which seemed in great peril of bodily damage. At last both combatants seemed sick of their bargain. So there was a temporary truce, which intermission of hostilities, as it often is with wiser bodies, was made the opportunity of a mutual effort to escape, the rat inspecting every part of the box, and gnawing at every crevice; the snake butting her nose in vain attempts to break through the glass. The truce lasted ten minutes. The rat was sitting quietly in a corner cleaning its face with its paws. The snake had ceased its vain darting at the glass cover, and, as if for rest, had spread itself over two-thirds of the floor of the box. It seemed as if a fair understanding had been reached, and that hostilities were really at an end. It was a treacherous calm. Incited by some cause the rat made a run for the opposite side of the box. Alas! this movement was the one fatal error of this little hero's life. In attempting this, it had to cross over a portion of its enemy's body. It was the merest touch, but that touch was death. Instantly every particle of the serpent's body flashed into activity, as if the whole had been powder, and a spark of fire had fallen on it. In the merest fraction of a second of time, the reptile that seemed to be lying so languid was transformed into an inverted nest, under which was the poor rat. I looked for the head of the snake. It was under this living nest, holding at the hinder part its victim, which was doubled up in this strange compression. And stranger still was the wonderful adjustment that a half minute of time sufficed to accomplish. The inverted nest of coils opened at its upper or convex end, like the crater of a miniature volcano. Out of this was evolved the head and front feet of the little rodent, whose dark lustrous eyes stood out and neck grew thick from the fearful compression. As the



pretty little flesh-colored hands lay upon that fatal upper coil, it did so look like the intercession of helpless suffering with pitiless power! This terrible constrictor, although the act was done in an instant, had fully exhausted all her ingenuity in throwing up this fearful engine of strangulation. It was not merely a series of nest-like constricting coils, but one great coil went transversely over all the others; as when the hand squeezes a lemon, and the other hand is made to help the compression. One could hear the bones crack! All this time the head of the serpent is underneath, holding its little captive in place, while that spiral vise squeezes out the brave little life that has so stoutly held its own against such odds in a mortal combat of two long hours. Happily death is almost instantaneous, for it is a literal crushing out of life.

Eight minutes have elapsed, and that spiral coil is still wound up, rigid and motionless as a rope of iron. How patient the creature is! So still, so quiet, one would hardly think it was alive. Now it withdraws its head from underneath the coils. This releases a part of the transverse fold, and gives to the head ten inches of free movement. That head is raised above its prey, and is there set at the extremity of an impending and motionless curve. Nor is there the least aspect of snakishness about the act, but a certain quiet air, as though the reptile was conscious that the thing was done. A change comes at last. The head is still aloft, the eyes are fixed on its victim, the neck and part of the long thorax swell with inspiration; then comes that indescribable blowing. It is evidently taking a good long breath after a tough job. There may be in it a relief to its nervous excitement. Is there in it any exultation? Who can tell? Now comes a slow, but general slackening, or relaxing of the coils. The head, however, is still kept aloft with the eyes set upon the little mangled body. As the upper coil opens the victim lies on one side, as if in a nest. The snake lowers its head and touches it with that delicate bifid tongue, which is doubtless an organ of acute feeling. Then it rubs its head against the dead little hero, pushing the head into, and moving it all round the coil for that purpose. This toying with its victim lasts about four minutes. At length the coils all slacken, and *Pituophis* stretches herself out for repose. She is now utterly indifferent about her conquest. We left the rat in the box until next day, when it was removed and subjected to a *post mortem*. I found the vertebræ dislocated in three places, one

place just back of the neck, and two places in the dorsal region.

Early in the second summer a splendid male *Pituophis* was sent me. It was seen swimming across a stream, and was captured after landing. It was about six feet in length. But a few minutes before an equally fine specimen was killed in the same place, and the belief was that this was its mate. The coloring was very bright, showy splashes of pale chestnut predominating. I put it with my female specimen. They took no notice of each other, though kept together until May of the next year, when the male died. I think it got some rough handling in its capture, from which it never recovered.

Old charcoal burners in the Pines entertain the belief that the pine snake destroys the rattlesnake; but I have never found the man that had seen the pine snake kill a rattlesnake. They say that generally they can tell if a rattlesnake is around by the smell, which is like that of a cucumber. That the pine snake can emit an odor of a far more powerful character than the rattlesnake, is well known to these men. Their notion is that the smell is thrown out with the breath when blowing. This I think is a mistake, except the fact that it may occur during the blowing, which is itself an act or manifestation of rage or other high emotion. There was a man in the Pines who kept up an objectionable familiarity with the snakes. He would put a black snake inside his hat, then go into the hostelry and banter some of the loungers to knock off his hat, an accommodation which was soon granted, when a display of Gorgon locks of raven hue would result, that constituted him, for the nonce, sole occupant of the premises. Such coolness would make any one a good observer. This man said he fell in with a very large pine snake in the woods. His words very nearly were, "You can tease a pine snake with a stick, and instead of trying to get away, it will coil itself, and give up. So I took a long stick and began teasing it. It reared itself, and began blowing (bellowing) fearfully, and there fell on me a stench so sickening, that I could not stand it. It seemed to rain on me! I turned and ran away as hard as I could! That the adult snake has this singular power must be accepted. The same experience has been given me by many others, and I have myself experienced it, though in a faint degree. I am not disposed to believe that it comes from the animal's mouth, however, and think that it can be

determined only by dissections of the posterior parts. This faculty may be compensatory — a means of defence for an animal naturally timid. And may it not be also for sexual attraction? In this particular it is probable the pine snake is not singular, and it is likely that where this function is feeble in the other snakes, it is strong enough for the latter purpose. A man very much beyond the average intelligence and education, a teacher in the Pines, said to me "I once saw a black snake come out of the woods into the soft sandy road; and it acted precisely as a dog does that is nosing out a scent. The snake came to a snake's track in the sand. It at once put itself in the track, and began to follow it; when, seeing me, it turned off to the woods and got away."

As is well known, the capacity of abstinence from food is remarkable among the serpents. Late in September, 1874, I killed a mouse, and gave to the female *Pituophis*. She seized it, gave it the usual squeeze, then swallowed it, taking just five minutes for the latter task. The next day I gave her another dead mouse, with exactly the same results. This was the first time that she had broken fast since September, 1873, — just one year before!

She had in the previous year on one occasion eaten a good-sized rat, that was given her dead, taking eighteen minutes for the operation. And I must mention here that I have known the Flat-head Adder or Blowing Viper, *Heterodon platyrhinos*, to eat the heads of the common eel, left on the shore by the fisherman. So that the assertion that snakes will not take food that they have not killed themselves, is not in all cases correct.

Late in August, 1873, I noticed that the snake seemed sickly. The dim, horny look of the eyes told the reason. She was nearly, if not quite, blind; and was about to cast off her old skin. To me, this was a time of anxiety, I was so anxious to witness an operation which I had never seen. On the 30th, owing to a restless night from illness, I rose later than usual. Went directly to the snake box — what a disappointment! The snake had cast her skin, and was now all aglow in her new winter dress. I was struck with the wonderful clearness of the eyes, and was reminded of the shoreman's slang, as previously given. I now saw a new significance in their vulgar speech; and it occurred to me that many a poor ophthalmic sufferer would rejoice if he could thus exuviate his optics.

But the desire came at last. Near the close of September, 1873, at 1 P. M., looking into the box, I saw that the snake had started the skin from her head. It was a little torn at the snout, and I found that the head and neck were denuded for about two inches. The denuding process was going on, but very slowly. Doubtless the chief difficulty was in starting the skin, and I felt sorry that I did not see the start. The neck was slowly becoming divested of the old cuticle, which, at first glance, had a sort of rolling aspect. What surprised me was the fact that there was not the least friction in the act; that is, there was no rubbing against any exterior object. As the old skin at this time is very moist and soft, any swelling of the body stretches and loosens it. So soon as the exuviation has reached the part of the body containing the larger ribs, this doffing of the old suit proceeds more rapidly, and with a singular system. It is done just in this way. Exactly at the place where the skin seems to be moving backward, a pair of ribs expands. This action enlarges the body and loosens the skin at that place. In this movement both ribs in the pair act at the same time, just as the two blades of the scissors open together. Now comes in a second movement of this pair of ribs. One of them — say the one on the right side — is pushed forward, and made to slip out of the constriction, when it is immediately drawn backward, that is, against the neck of the old skin. Now the left rib makes a like advance, and in a like manner presses backward. Thus the final action of the ribs is not synchronous, but alternate. And how notable becomes the sameness of result in this action with that of the alternate hitching of each side of the mouth when swallowing. Indeed, swallowing by a serpent is a misnomer; for that laborious hitching is not a pushing of the prey down the gullet, but a drawing of the body over it. The western man said, he always felt better after getting himself around a two-pound steak. With the serpent, this is a literal fact; it puts itself outside of its victim. And so with the singular action of the ribs—it seems to push the skin backwards; but this is an illusion, for it actually pushes itself forward, and advances out of the skin, thus with each movement or advance, lengthening the double cylinder behind; that is, the old hose evolves from itself forward, though it appears to be rolled on itself backward.

The ribs of a serpent, which extend very nearly throughout its whole length, are very much smaller in the neck and tail. At

these parts exuviation is much slower than when the larger ribs have play. This rib action produced a singular automatic movement of the serpent on the floor of its box, and even across the folds of its companion, which kept as still as if it were dead. The movement of the snake's body, as the skin did not follow it, gave the creature the appearance of crawling out of a tubular case. The skin of course was presented inside out, so that every scale showed its concave side, which was true also of the scales of the eyes. To all this was one exception. The last scale of the tail is a hollow pyramidal, or four-sided spike. It is fully half an inch in length. This, for plain reasons, was not inverted. The entire process of exuviation, allowing five minutes for the part that I did not witness, took thirty-five minutes.

There was a great contrast of color and brilliancy between the old and the new attire! Unversed in serpentine psychology, we are not able to say what went on in the caput of this creature, which the adage has made so famous for wisdom. With a dress of such a rich creamy glow, and such adornings of brown, and chocolate, and chestnut, what blame if it were proud of its new attire? She certainly seemed to show her feelings in a feline way, for she rubbed her head, with a seeming cat-like complacency, against that of her companion. As for him, poor fellow, he had been ten weeks trying to get his trousers off, and after this panting time, had only succeeded in tearing the garment. He seemed now to be acting like that human, who, after a vain tussle with his tight boots, retired to allow his mind time to regain its composure. The truth told, it took Mr. Pituophis exactly three months to get off his pantaloons. It would only come off in bits at a time, and by painful friction, which, as shown above, is not the normal way of a snake's undressing. Indeed, it looked as if a valet would have to be provided. But on the 13th of October, a warm Indian summer day, he was successful in doffing his old vestment. Having got out of those dilapidated tights, he looked more comfortable, and in his new suit appeared a very presentable fellow.

Even in its excrementing, it observes a singular method, which, however, is perhaps not peculiar to itself. In every instance—and I have made a number of observations—the first voiding is a clear liquid. This would make a circular spread on the floor of the box, about as large as one's hand. In the middle of this was immediately voided a heap of a uniform granular powder, of a

deep straw color. This was about as wide as a dollar. On top of this was a smaller mass composed entirely of hair, unchanged from its natural color. This was the indigested portion of its last meal. This excrement was made three weeks after its meal of two rats. It is to be remarked, there was not the smallest bit of indigested bone. I regret that my intention to secure chemical analyses was not carried out.

When the summer was advanced I put into the box a fresh sod of grass. After a while the snake became very fond of it, but its first acquaintance with it was the occasion of a singular demonstration. The stupid thing at once assumed an attitude of threatening inquiry. It raised its head aloft, and in the direction of the strange object, vibrating its tongue, and keeping its eyes intently fixed upon it. That head, and the part of the body thus elevated looked as rigid as if cast in brass. And for a full hour was that statuesque rigidity of posture sustained. How much longer I know not, as I was called away. This singular command of the muscles is probably peculiar to all the constrictors. The common black snake can be taken in the hand by the lower part of the body, and the rest of the animal be projected forward, of its own will, in a straight rigid line. Owing to this command of the muscles the pine snake is capable of performing some evolutions, which are not only beautiful, but so intricate and delicate as to make them seem imbued with the nature we call spiritual. I have often seen the *Pituophis* spread out in loose coils with its head in the central one, wake up after a long repose and begin a movement in every curve, the entire body engaged in the mazy movement, with no going out, or deviation from the complicated pattern marked on the floor. Observing this intricate harmoniousness of movement, I thought of the Seer's vision of the mystic wheels. Those revolving coils—"As for their appearances, they four had one likeness, as if a wheel had been in the midst of a wheel." In the popular pictorial tablets of Natural History in Japan, their generic idea of a snake is given in the words *Kuchi Nawa*, "Rope with mouth at end." And this is pretty much the crude popular conception of an ophidian the whole world over. But the movements of a serpent are never started rope-like at one end, and thus transmitted to the other; nor is the movement like the force-waves sent through a ribbon vibrating in the air. The movement consists of numberless units of individual activities, all reg-

ulated by and under the perfect control of one will, that is felt in every curve and line. There is some likeness to the thousand personal activities of a regiment seen on their "winding way." And all this perfection of control of so many and complicated activities is true, whether a serpent like an ogre be crushing its victim's bones, or as a limbless posturist be going through its inimitable evolutions. In our thinking a serpent ranks as a paradox among animals. There is so much seeming contradiction. At one time encoiling its prey as in iron bands; again assuming the immovable posturing of a statue; then melting into movements so intricate and delicate that the lithe or limbless thing looks like gossamer incarnate. In this creature all the unities seem to be set aside. Such weakness, and such strength; such gentleness, and such vindictiveness; so much of beauty, and yet so repulsive; fascination and terror:—what need of wonder that whether snake or python, the serpent should so figure in the myths of all the ages, and the literature of the whole world! Yes, in the best, and the worst thinkings of men!

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## BOTANICAL OBSERVATIONS IN SOUTHERN UTAH, IN 1874. I.

BY DR. C. C. PARRY.

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THE hastily gathered collection of plants made by Fremont on his adventurous return trip from California, in the spring of 1844, contained quite a number of remarkable new forms, from the little known district adjoining the valley of the Virgen, then included in the Mexican Territory of Upper California. Several of these newly discovered plants, as far as the imperfect material allowed, were described by Dr. Torrey and Prof. Gray, in Fremont's Report, "*Plantæ Fremontianæ*," and other scientific publications. Subsequently the inaccessibility of the country, and the hostile character of the Indian tribes occupying this district, prevented for a time farther botanical researches. With the growth of Mormon settlement gradually extending southward from Salt Lake, the obstacles to exploration were in great measure removed and the valley of the Virgen lay along the line of one of the travelled routes to southern California. During this period, late in the year